



## **2012 Aerial Survey Results Questions and Answers**

### **Q: What is the current state of the mountain pine beetle epidemic?**

**A:** The Mountain Pine Beetle epidemic has slowed considerably in most areas of Colorado compared to the past four years. This year the affected area only expanded by 31,000 acres compared to 140,000 acres in 2011. This is because the supply of mature lodgepole pine trees have been depleted in the core of the outbreak areas. Although some spread is still occurring on the Front Range and in the peripherals of the core outbreak areas, the slowed growth rate means the epidemic is in decline.

### **Q: What do forest visitors need to know when they see dead trees or visit National Forests?**

**A:** The national forests continue to be great places to experience the outdoors, but visitors must exercise caution when recreating. Bark beetle-affected trees pose a safety hazard to the general public. Live, dead, or “red” trees can fall at any time without warning because of shallow roots. To reduce your risk, watch for weather before visiting the forests and stay away from areas with dead trees on windy days. Immediately move to an open area if it gets windy while in the forest. The best defense is to be aware of surroundings and weather conditions. Do not camp or pitch a tent within falling distance of dead trees regardless of the weather conditions.

### **Q: What is being done to manage the areas affected by mountain pine beetle?**

**A:** Safety of the public and our employees and mitigating the effects of the outbreak are top priorities for the Rocky Mountain Region. The USFS utilizes partnerships and innovative stewardship contracts to improve safety, forest resiliency, and accelerate forest recovery. In 2012, the USFS awarded two 10-year stewardship contracts on both the Medicine-Bow Routt and the White River National Forests to remove dead trees, thin densely stocked forest stands, and reduce fuel loading on a total of 20,000 acres.

### **Q: What can be done with the trees removed from the forest?**

**A:** Because of stewardship contracting and continued collaboration among the USFS and local communities, the forest products industry is in a better position today as new mills come on line to take advantage of trees being removed from forested lands in Colorado. The Forest Service is working to provide a reliable and predictable supply of biomass.

### **Q: Why is Colorado experiencing a spruce beetle epidemic?**

**A:** The spruce beetle outbreak that is affecting many of the mature spruce forests in southern Colorado is a natural event that will change the appearance of the forest for some time to come. Spruce beetle and spruce trees have evolved together. The primary



disturbance agent for high elevation mature spruce trees is spruce beetle. This relationship results in the death of old stands and the initiation of new stands.

The southern national forests (Rio Grande NF, San Juan NF and Gunnison NF) have been experiencing epidemic populations of spruce beetle for several years. Spruce beetle infestation in mature spruce stands generally happen after mature spruce trees are blown down after a high wind event. Spruce beetles are attracted to the weakened, fallen trees; they bore into them and begin to reproduce. The more “blow down” that occurs the more opportunity is provided to the spruce beetle to build up high populations.

Not all blow down events result in epidemics, but this epidemic has many of the same causes as the mountain pine beetle epidemic, i.e. large mature trees stressed due to densely stocked stands, drought conditions over several years and warmer winters. Once the populations of spruce beetles built up in the fallen trees, the stressed trees surrounding them offered little resistance to attack. The warmer winters over the last couple of years have allowed a higher percentage of beetles to survive the winter. Consequently, the beetle flight (when new adult beetles emerge from the dead tree) in the summer of 2012 was the largest witnessed by entomologists in decades.

**Q: How is Spruce beetle different than Mountain Pine beetle?**

**A:** The two beetles are closely related, are both native to Colorado, and although there are subtle differences in the range of size and color of these beetles, these characteristics can overlap. There are more obvious differences in their behavior and in the tree species that they attack. Spruce beetles attack Engelmann and blue spruce trees and mountain pine beetles attack lodgepole, ponderosa and limber pines in Colorado. Spruce beetles typically require two years to complete their life cycle in Colorado’s high elevation forests while mountain pine beetle completes a life cycle in one year. Pine trees attacked by mountain pine beetle turn red the year following attack and fade to gray as needles fall. Spruce trees attacked by spruce beetle fade to a more subtle yellowish green over several years and crowns turn red/brown as needles fall. Spruce beetle epidemics are often triggered by spruce beetle populations building up in wind thrown trees and then moving into adjacent standing trees. Mountain pine beetles are not attracted to wind thrown trees. Epidemics for both beetles can be triggered by older and denser stand conditions and stress from drought.

**Q: What areas of Colorado will be most affected by Spruce Beetle?**

**A:** Spruce beetle affects areas on both federal and private lands. Moderate to severe epidemics currently affect many of Colorado’s high elevation spruce forests. The southern Colorado epidemic has expanded most dramatically. Large numbers of beetles have been transported with prevailing winds, infesting new areas, and quickly expanding the scope of



the outbreak. In some locations non-host lodgepole pine and immature spruce down to 1 inch DBH have been attacked and killed.

Epidemics are occurring in and around:

- southern Colorado on the Rio Grande (102,000 new out of 165,000 active acres) , San Juan NF (19,000 new acres out of 39,000 active acres), and Gunnison NF (8000 new acres out of 24,000 active acres);
- the Grand Mesa NF (8,000 new out of 24,000 active acres);
- the Wet Mountains on the San Isabel NF (1,200 new acres out of 1,700 active acres);
- activity continues on the White River (3,000 active acres); and
- in northern Colorado portions of the Arapaho-Roosevelt National Forest, Routt National Forest and Rocky Mountain National Park (16,000 new acres out of 32,900 active acres).

Localized infestations also were detected on the eastern slopes of the Sangre de Cristo Range. Small groups of dead and dying spruce were detected along the Continental Divide as far north as Monarch Pass.

**Q: What can Colorado expect to see in spruce beetle affected forests over the next year?**

**A:** Spruce beetle mortality can take more than a year to become obvious. Trees attacked last year are still green. Bark flakes lying on the snow from woodpecker feeding may be the most obvious sign of attack on these trees. Older hit trees appear a lighter or yellowish green and as needles fall the standing dead trees have a brownish cast to their tree crowns. Trees that have root rots or heart rots are typically the first to fall, split or break. Trees with sound wood may stand longer but this varies greatly. Some large green trees that were not killed by beetles may also be blown over by wind as their canopies are no longer protected by neighboring live tree canopies.

**Q: What can be done to manage the spread of Spruce beetle?**

**A:** While these large disturbance events result in the death of large numbers of trees over vast areas, the removal of the old stands paves the way for new trees in a continual process of succession. In a similar manner, these large disturbances catalyze management activities in an effort to restore forested areas and maintain resiliency within the ecological system. Forest Service response has been rapid, and utilizes many management tools. Some examples of Forest Service responses include:

- Campground remediation and recovery which includes the removal of the dead overstory trees to provide a safer environment for the public and to allow growing space for the still living tree and planting a variety of new trees to accelerate their revegetation;
- Using flexible timber sale contracts to allow for the inclusion of newly infested trees within an existing timber sale area; and



- Using service contracts to remove “trap trees” (mature spruce trees that are intentionally felled to draw spruce beetles to infest a particular site) before the adults can emerge thereby reducing the population.

**Q: Do beetle-affected trees pose a greater fire danger?**

**A:** The relationship is between bark beetles and wildfire is complex and varies by location, habitat types, the intensity of the attack and time since the attack. Generally speaking, crown-and surface-fire hazard change with time following outbreaks, and factors such as weather and forest composition play large roles in determining whether and how intensely a fire will burn.<sup>1</sup>

Research tells us that at the stand level, both crown and surface-fire hazards<sup>2</sup> change through time after a bark beetle outbreak in a stand of living trees<sup>3</sup>. The fire hazard is high in the period one to two years after pine trees die since the dead needles are retained in the tree’s crown, stocking the canopy with dry, fine fuels that can ignite quickly during weather conditions conducive to fire.<sup>4</sup> As the trees lose their needles, the fire risk in the crowns of the trees decreases as fire doesn’t spread through standing dead trees with no needles very quickly. Surface fire hazard increases again as dead trees begin to fall and create a heavy fuel bed with young trees growing up through the tangle of down logs<sup>5</sup>.

For more information about insects and diseases in our Region, please visit our [Forest Health Protection website](#).

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<sup>1</sup> [Bentz](#), et. al. (2009) Bark Beetle Outbreaks in Western North America: Causes and Consequences, Bark Beetle Symposium, Snowbird, Utah.

<sup>2</sup> The term Fire hazard as used here refers specifically to the state of fuels in a given stand – independent of variables such as temperature, wind, and precipitation that influence fuel moisture content and fire occurrence.

<sup>3</sup> [Bentz](#), et. al. (2009) Bark Beetle Outbreaks in Western North America: Causes and Consequences, Bark Beetle Symposium, Snowbird, Utah.

<sup>4</sup> Page, W.; Jenkins, M. 2007. Mountain pine beetle-induced changes to selected lodgepole pine fuel complexes within the intermountain region. *Forest Science* 53(4):507-518.

Page, W.; Jenkins, M. 2007. **Predicted Fire Behavior in Selected Mountain Pine Beetle–Infested Lodgepole Pine**. *Forest Science* 53(6):662-674

Hawkes, B. 2008. Effects of the mountain pine beetle on fuels and fire behaviour. In *Mountain Pine Beetle: From Lessons Learned to Community-based Solutions Conference Proceedings*, June 10–11, 2008. *BC Journal of Ecosystems and Management* 9(3):77–83.  
[http://www.forrex.org/publications/jem/ISS49/vol9\\_no3\\_MPBconference.pdf](http://www.forrex.org/publications/jem/ISS49/vol9_no3_MPBconference.pdf)

Jenkins, M., Hebertson E., Page, W. and Jorgensen C. 2008 Bark beetles, fuels, fires and implications for forest management in the Intermountain West. *Forest Ecology and Management* 254 (2008) 16–34

<sup>5</sup> [Bentz](#), et. al. (2009) Bark Beetle Outbreaks in Western North America: Causes and Consequences, Bark Beetle Symposium, Snowbird, Utah.